

Utility Patent Application

CONFIDENTIAL INFORMATION

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FOUR WHEEL DRIVE MANUAL HUB LOCK AND UNLOCK TOOL

RELATED APPLICATIONS

The present invention was first described in Disclosure Document Number 461616 filed on September 2, 1999. There are no previously filed, nor currently any co-pending applications, anywhere in the world.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to four-wheel drive trucks and, more particularly, to a four-wheel drive hub locking and unlocking tool.

2. Description of the Related Art

The popularity of off-road and sport utility vehicles is at an all-time high. These vehicles, touted for their ruggedness, durability and ability to travel over a variety of terrains, possess features such as four-wheel drive, high-output engines and heavy-duty suspensions that will withstand the rigors of off-road travel. Especially popular for hunters and outdoors men, these vehicles allow them to reach camping and hunting sites that would otherwise be inaccessible. While most newer vehicles have electric mechanisms to engage and disengage the four-wheel drive systems, there is still a great abundance of vehicles with manual transfer hubs. These hubs must be locked and unlocked manually from outside the vehicle at each of the wheels. While this is not too much of an effort during fair weather conditions, it is a great aggravation during bad weather, which ironically, is when the four-wheel drive system is needed the most. Many times the user must remove gloves to rotate the transfer level subjecting the user to cold temperatures, and possible hand injury from skinned knuckles should the user lose balance while turning the hubs. Accordingly, there exists a need for a means by which manual four-wheel drive hubs can be engaged and disengaged quickly and easily. The development of the four wheel drive manual hub lock and unlock tool fulfills this need.

In the related art, there exists various patents for unlocking tools for hubs for four wheel drive vehicles. However, there does not exist any patents for a hub locking/unlocking hubs for four wheel drive vehicles with an elongated handle and a handgrip like the present invention.

5 A search of the prior art did not disclose any patents that read directly on the claims of the instant invention; however, the following references were considered related:

U.S. Pat. No.	Inventor	Issue Date
5,908,080	<i>Bigley et al.</i>	Jun. 1, 1999
5,520,272	<i>Ewer et al.</i>	May 28, 1996
4,061,058	<i>Douglas</i>	Dec. 6, 1977
D 357,617	<i>Morrisette</i>	Apr. 25, 1995
D 261,606	<i>La Fargo et al.</i>	Nov. 3, 1981
5,850,679	<i>Hoffman</i>	Dec. 22, 1998
5,797,301	<i>Huenke</i>	Aug. 25, 1998
4,620,462	<i>Parker</i>	Nov. 4, 1986
4,028,915	<i>Stahl</i>	June 4, 1977
D 341,759	<i>Vasilakis</i>	Nov. 30, 1993
D 292,963	<i>Murtaugh</i>	Dec. 1, 1987

Consequently, a need has been felt for providing an apparatus with an improved handle and a handgrip to improve torque.

SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide an improved four-wheel drive hub tool which allows manual four-wheel drive hubs to be engaged and disengaged easily.

It is another object of the present invention to provide increased leverage on the four-wheel drive hub tool.

It is another object of the present invention to decrease the time that must be spent in inclement weather engaging and disengaging hubs.

It is yet another object of the present invention to protect the user's hands.

It is yet still another object of the present invention that it can be used with gloves on.

It is another object of the present invention to work with all four-wheel drive vehicles.

Briefly described according to one embodiment of the present invention, the four wheel drive manual hub lock and unlock tool, as its name implies, is an apparatus that aids in the manual locking and unlocking of four-wheel drive hub mechanisms. Two disc shaped plates are connected together with an elongated section of steel rod of a length of approximately six to eight inches. A channel of approximately 1/2 inch in width is cut in the front surface of one of the discs for receiving the hub locking lever on the four-wheel drive vehicle. A section of a

spongy textured material formed in the shape of a handgrip is wrapped around and secured to the rod section to provide a gripping surface. The extended length of the rod section allows for additional leverage which makes the locking and unlocking of the hub easier. Additionally, with the users hands located away from the hub, there is less chance for hand injury, should the user slip when the hub turns. Also, the user may keep their gloves in inclement weather offering additional protection for hands. The use of the four wheel drive manual hub lock and unlock tool makes the task of locking and unlocking hubs quick, easy and effortless no matter what the weather conditions are, while increasing safety for the user.

BRIEF DESCRIPTION OF THE DRAWINGS

The advantages and features of the present invention will become better understood with reference to the following more detailed description and claims taken in conjunction with the accompanying drawings, in which like elements are identified with like symbols, and in which:

FIG. 1 is a perspective view showing the intended use of the four wheel drive manual hub lock and unlock tool, according to the preferred embodiment of the present invention;

FIG. 2 is a perspective view of a four wheel drive manual hub lock and

unlock tool, according to the preferred embodiment of the present invention;

FIG. 3 is an exploded perspective view of a four wheel drive manual hub lock and unlock tool, according to the preferred embodiment of the present invention;

5 FIG. 4 is a side view of a four wheel drive manual hub lock and unlock tool, according to the preferred embodiment of the present invention;

FIG. 5 is an end view of a Four wheel drive manual hub lock and unlock tool showing the channel formed in the disc shaped plate for engaging the locking/unlocking lever on a four-wheel drive hub; according to the preferred embodiment of the present invention; and

FIG. 6 is the opposite end view thereof of a four wheel drive manual hub lock and unlock tool; according to the preferred embodiment of the present invention.

LIST OF REFERENCE NUMBERS

	5	Four Wheel Drive Vehicle	15a	Ridge
	6	User	15b	Channel
10	10	Four Wheel Drive Manual Hub Lock and Unlock Tool	16	Rod
20	15	Front Disc	17	Rear Disc
			20	Handgrip

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The best mode for carrying out the invention is presented in terms of its preferred embodiment, herein depicted within the Figures.

1. Detailed Description of the Figures

5 Referring now to FIG. 1, a four wheel drive manual hub lock and unlock tool 10 is shown, according to the present invention, for use in locking and unlocking the four wheel drive hub on four-wheel drive vehicles 5 and the like. Typically, such vehicles are manually switched from two wheel drive to four wheel drive by twisting the inner lever on both the left and right front wheel hub. Normally, this is done by grasping the lever by hand and turning it. The hub has only two positions. One is for two wheel drive and the other is for four wheel drive. However, with the four wheel drive manual hub lock and unlock tool 10 this process is greatly simplified. A user 6 simply grabs the elongated handle and engages the channel with the lever in the center of the hub and urges the
15 lever into the desired position.

Referring now to Figures 2 and 3, a perspective and exploded perspective view of the four wheel drive manual hub lock and unlock tool 10 is shown. Essentially, the device 10 consists of two discs, front disc 15 and rear disc 17 connected together by an elongated rod 16 to the center of each disc in a
20 perpendicular fashion as shown. Elongated rod 16 acts as a handle between

front disc 15 and rear disc 17. Front disc 15 and rear disc 17 are fabricated from metal and attached to elongated rod 16 by welding or the entire assembly can be formed by metalworking machinery. A channel 15b is formed in the outer surface of front disc 15 for engaging the locking/unlocking lever of a four wheel drive vehicle hub. The size of front disc 15, rear disc 17, and channel 15b are chosen according to the particular make and model of four wheel drive vehicle it is intended for. Many different sizes would have to be made available for the various size hubs according to vehicle and wheel hub manufacturer. Referring to FIG. 4, the finished assembly is wrapped by a handgrip 20 made from a slip resistant material such as rubber and formed with a grips that conform to a user's hand. The diameter of elongated rod 16 is of no particular size except that it must at least be large enough so that handgrip 20 can be permanently attached using known methods such as adhesives.

FIG. 5 shows the outer surface of front disc 15 with a channel 15b formed through the center. Channel 15b is wide enough to engage the locking/unlocking lever of a four wheel drive hub. A pair of ridges 15a sit adjacent to channel 15b. A rear view of the four wheel drive manual hub lock and unlock tool 10 is shown in FIG. 6 showing the slightly oversized handgrip 20 on the assembled device 10.

2. Operation of the Preferred Embodiment

In operation, the end of present invention with the specially formed channel is simply placed over the locking/unlocking lever on either the left or right locking/unlocking lever on a four wheel drive hub. The lever is urged into either the locking or unlocking position by grabbing the handle and twisting. The tool is then removed and stored in the vehicle until the next use.

The foregoing description is included to illustrate the operation of the preferred embodiment and is not meant to limit the scope of the invention. The scope of the invention is to be limited only by the following claims.